C-157

5 March 1962

Progress Report No. 1
Project 1158-5

Dear Sam:

During your last visit, we discussed ways by which this program would be started. The camera was found to be not satisfactory in its present form. For this reason, we had to build a special type of sample centering mechanism to be placed in the present camera. This device will enable us to center accurately the sample in the collimating device so as to permit the use of very small amounts of material, as well as to enable us to relocate the position of the sample accurately each time a change is made in the material. The device is designed so that the sample container may be removed for loading and replacing without disturbing the alignment. This becomes extremely important because of the nature of the microanalysis. Our first sample holder will have a 16 mil hole drilled for containing the sample. We will attempt to reduce this diameter to 4 mil, which should be the limit with the present setup. If we are successful in obtaining x-ray diffraction patterns at this lower limit, we should be able to look at the very small amounts of material we are anticipating for direct analysis.

At this writing, we have not received the device from the shop, but are using the time to get everything set up so that we may proceed in earnest. We intend to use the pure materials first, to obtain standard patterns, and we will dilute these materials with MgO_2 of suitable particle size in order to get the

proper dilution effects which will be representative of the total sample which we are to analyze eventually.

After obtaining the films, we will measure them with one of our densitometers and prepare a film system giving the interplanar spacings (d/n) versus the relative intensity of the diffraction ring. These should serve as indexing data for future reference.

Conventional laboratory supplies appear to be quite large for this work, and therefore we are miniaturizing even these to be suitable for the analysis at hand.

Brad has been assigned Principal Investigator for this program, and is being supported in the laboratory work by Dave. I am taking more than an administrative interest in the work and will be much closer to the laboratory procedures and interpretations than on previous programs.

When everything can be more or less reduced to a stable procedure, we should be in good shape to routinely investigate small samples.

Sincerely,

George